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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/566,831	02/01/2006	James T. Leach	12,757-WO	8033

26387 7590 04/23/2008

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EXAMINER	
VANOY, TIMOTHY C	
ART UNIT	PAPER NUMBER
1793	

MAIL DATE	DELIVERY MODE
04/23/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/566,831	LEACH ET AL.	
	Examiner	Art Unit	
	TIMOTHY C. VANOY	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-69* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *2-5,7-11,13-16,19,21-27,29,30,32-41,43,44,50,51,53-56 and 58-66* is/are allowed.

6)☒ Claim(s) *1,6,12,17,18,20,28,31,42,45-49,52,57 and 67-69* is/are rejected.

7)☒ Claim(s) *28* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *07 November 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *Feb. 27, 2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

a) In claim 28 step d), "stoichiometric" is misspelled.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1, 12, 18, 20, 28 and 31 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a) In claim 1 step a), it is unclear what the metes and bounds are of "sufficient output".

b) A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. See MPEP § 2173.05(c). Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131

USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949). In the present instance, claim 1 recites the broad recitation "180 nm and 220 nm", and the claim also recites "preferably in the range of 193 to 206 nm" which is the narrower statement of the range/limitation.

c) The term "high" in claim 12 is a relative term which renders the claim indefinite. The term "high" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

d) In claim 18 step a), it is not clear what the metes and bounds are of "sufficient output".

e) A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. See MPEP § 2173.05(c). Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949). In the present instance, claim 18 recites the

broad recitation "between 172 nm and 220 nm", and the claim also recites "preferably in the range of 179 nm to 190nm" which is the narrower statement of the range/limitation.

f) Regarding claim 20, the phrase "such as" renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

g) A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. See MPEP § 2173.05(c). Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949).

(i) In the present instance, claim 28 recites the broad recitation "180 nm and 220 nm", and the claim also recites "preferably in the range of 180 to 193 nm" which is the narrower statement of the range/limitation.

(ii) Claim 28 also recites the broad range "180 nm and 220 nm", and the claim also recites "preferably in the range 193 to 206 nm" which is a narrower statement of the range/limitation.

h) In claim 28 steps a and c, it is unclear what the metes and bounds are of "sufficient output".

i) The term "low" in claim 31 is a relative term which renders the claim indefinite. The term "low" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

The person having ordinary skill in the art has the capability of understanding the scientific and engineering principles applicable to the claimed invention. The references of record in this application reasonably reflect this level of skill.

Claims 1, 6, 17, 42, 45-49, 52, 57, 67, 68 and 69 are rejected under 35 U.S.C. 103(a) as being unpatentable over U. S. Pat. 4,585,631 to Pfeiffer.

Claim 1 in the Pfeiffer patent renders obvious a process and apparatus for removing nitrogen oxides out of a combustion flue gas, comprising:

providing the combustion flue gas;

providing a reducing agent, such as ammonia;

irradiating the reducing agent with radiant energy emitted by a laser to increase the reactivity of the reducing agent;

blending combustion flue gas with the irradiated reducing agent in a reaction chamber to convert the nitrogen oxides into innocuous flue gas constituents.

Claim 6 in the Pfeiffer patent further sets forth that the reducing agent is exposed to laser radiation before the reducing agent is blended with the combustion flue gas,

and the laser radiation irradiating substantially all of the molecules of the reducing agent before reaching the reaction chamber.

The difference between the Applicants' claims and this Pfeiffer patent is that the Applicants' claims call for the use of ultra-violet radiation of specified wavelengths (whereas the Pfeiffer patent only mentions the use of "coherent light" emitted from the laser: please also see col. 2 lns. 18-23), *however* it is submitted that this difference would have been obvious to one of ordinary skill in the art at the time the invention was made *because* the function and effect and effect of the Applicants' ultraviolet radiation and Pfeiffer's laser radiation is the same (namely, activating the ammonia into a reactive species) - *thereby fairly suggesting* that the Applicants' radiation and Pfeiffer's radiation is the same. Further evidence of obviousness can be found in Applicants' claim 6 where the Applicants' appear to set forth that they also use a laser.

Allowable Subject Matter

Claims 2-5, 7-16, 18-41, 43, 50, 51, 53-56 and 58-66 have not been rejected under either 35USC102 or 35USC103 because the limitations of these claims are not taught or suggested in either U. S. Pat. 4,585,631 or any of the other references of record.

The following additional references are made of record:

U. S. Pat. 7,156,957 B1 disclosing the UV induced oxidation of nitric oxide;

U. S. Pat. 6,907,831 B1 disclosing a photolytic method of dissociating at least a portion of NO_2 in a combustion off-gas;

U. S. Pat. 6,761,863 B2 disclosing the use of ozone and ultra-violet radiation to remove nitrogen oxides (please see the abstract);

U. S. Pat. 4,995,955 disclosing an optically-assisted gas decontamination process, and

U. S. Pat. 4,969,984 disclosing an exhaust gas treatment process using radiation.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to TIMOTHY C. VANOY whose telephone number is (571)272-8158. The examiner can normally be reached on Mon-Fri 8-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman, can be reached on 571-272-1358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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